AUDIOGRAPHICS COMMUNICATION SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to an audiographics communication system and more particularly to an interactive graphics and audio communications terminal.

In an office or business environment, it is desirable to provide a communication capability for both audio and graphics information. There have been numerous prior art approaches relating to a communications capability for audio and graphics data which in general are quite complex and/or costly.

Part of the problem with the prior art is the difficulty in establishing voice and graphics communications in a suitable fashion. Some prior art systems provide for a terminal which will display graphics data but does not provide suitable interactive audio information with the graphics data. This aspect is undesirable in a business environment such as where a design engineer wishes to discuss a particular graphics display pattern with someone else located within the business. With such a prior art approach it becomes difficult and/or awkward to communicate on an audio basis while discussing the graphics data being displayed.

Some prior art approaches provide for audio and graphics intercommunications, but such approaches often require the use of what is known as an X-Y pad for "writing" the graphics data. The X-Y pad does not result in a common viewing and drawing surface, which often makes interaction among users awkward.

In view of the foregoing background, it is an objective of the present invention to provide an improved audiographics communications system.

SUMMARY OF THE INVENTION

The present invention relates to an audiographics communications system and terminal.

In one embodiment, the system includes a plurality of audiographic terminals interconnected to a common telephone line. Each of the terminals includes means for transmitting and receiving analog data over the common telephone line where the data includes information representing simultaneous audio and graphics information.

Each terminal also includes an integrated speakerphone to enable operators to converse with one another and display means for visually displaying the graphics data.

Each terminal also includes a light pen for enabling an operator to "write" graphics information on the display screen so that with interconnected terminals operators can audibly communicate easily and discuss the graphics data simultaneously displayed on the terminal. Thus, the viewing and drawing surfaces are one and the same, which enhances the interactiveness of the terminal.

In accordance with the foregoing summary, the present invention achieves the objective of providing an improved audiographics communication system.

Other objects and features of the present invention will become apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** depicts an audiographics communication system according to the present invention.

FIG. **2** depicts a presentation on a terminal in initial operation.

FIG. **3** depicts drawing page control pads appearing on a terminal of FIG. **1**.

FIG. **4** depicts an internal block diagram of an interactive audiographics terminal of FIG. **1**.

FIG. **5** depicts a schematic diagram of a video processor section which forms a portion of FIG. **4**.

FIG. **6** depicts a schematic diagram of a display RAM which forms a portion of FIG. **4**.

FIG. **7** depicts a schematic diagram of light pen synchronizer/register logic, which forms a portion of FIG. **4**.

FIG. **8** depicts a schematic diagram of an audio processor section which forms a portion of FIG. **4**.

FIG. **9** depicts a schematic diagram of digital filters which form a portion of FIG. **4**.

FIG. **10** depicts a schematic diagram of codec/analog circuits which form a portion of FIG. **4**.

FIGS. **11–13** depict flow diagrams for illustrating a cycle of operation of the present invention.

DESCRIPTION OF THE DRAWINGS

Referring now to FIG. **1**, an interactive audiographics communication system according to the present invention is illustrated. In FIG. **1**, the interactive audiographics communication system includes a pair of terminals **10**, **12** interconnected by a common telephone line **14**.

Each terminal **10**, **12** in FIG. **1** includes a respective light pen **16**, **18** for enabling the "drawing" of figures on the respective screen **20**, **22**.

The interactive audiographics system depicted in FIG. **1** also includes a built-in speakerphone in order to permit users to simultaneously communicate verbally over telephone line **14** while discussing a graphics image written on either of the display screens **20**, **22**. The system in FIG. **1** permits users to communicate verbally and graphically over a single telephone line **14**. The system can be used for studio teleconferencing and desk-to-desk or person-to-person communications. Additionally, a terminal **10**, **12** can replace a telephone on a user's desk while providing graphics enhancement when another terminal is "called."

In FIG. **1**, a user of terminal **10** can draw or write directly on the face **20** of the viewing and writing screen **20** using the light pen **16**. As the image or text is drawn or written, it is transferred to another terminal **12** connected to telephone line **14**. Users can also simultaneously communicate verbally through built-in speakerphones.

The system depicted in FIG. **1** is designed to be "user-friendly." All functions, including telephone dialing, can be performed by touching a light pen to the appropriate control pad on the display screen, as will be described. The control pads are typically described by single action words which enhance the simplicity of its use.

Referring now to FIG. **2**, data typically displayed initially on the screen of a terminal **10** of FIG. **1** is illustrated. The display in FIG. **2** can be referred to as a "phone page." The specific functions illustrated in FIG. **2** are identified as follows: